

इंटरनेट

मानक

### Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 593 (1978): Salt for hide-curing (wet salting) [CHD 1: Inorganic Chemicals]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



*Indian Standard*  
SPECIFICATION FOR  
SALT FOR HIDE CURING (WET-SALTING)  
(*Second Revision*)

UDC 675.021 : 661.42



© Copyright 1978

INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

Rs 7.00  
Gilt

November 1978

# Indian Standard

## SPECIFICATION FOR SALT FOR HIDE CURING ( WET-SALTING ) ( Second Revision )

Alkalies and Chlorine Sectional Committee, CDC 25

*Chairman*

SHRI M. L. SETH

*Representing*

Shriram Chemical Industries, New Delhi

*Members*

SHRI A. K. BHATTACHARYYA

National Test House, Calcutta

SHRI A. K. BOSE

Directorate General of Technical Development,  
New Delhi

SHRI R. C. BHATTACHARYA ( *Alternate* )

SHRI C. A. GHAREKHAN

Calico Chemicals & Plastics Division, The  
Ahmedabad Mfg & Calico Printing Co Ltd,  
Bombay

DR A. GUPTA

Durgapur Chemicals Ltd, Durgapur

SHRI S. K. CHATTERJI ( *Alternate* )

SHRI JAI GOPAL JAIN

Dhrangadhra Chemical Works Ltd, Dhrangadhra;  
and Indian Chemical Manufacturers' Association,  
Calcutta

SHRI P. N. DEVARAJAN

Indian Chemical Manufacturer's Association,  
Calcutta

SHRI L. R. KRISHNAMURTHY

The Mettur Chemical & Industrial Corporation Ltd,  
Mettur Dam

SHRI M. PADMANABHAN ( *Alternate* )

SHRI A. SREEKANTAN NAIR

Travancore Cochin Chemicals Ltd, Udyogamandal

SHRI C. N. GOPINATHAN NAIR

( *Alternate* )

SHRI N. B. PATEL

Tata Chemicals Ltd, Bombay

SHRI D. N. V. RAO ( *Alternate* )

REPRESENTATIVE

The Travancore Rayons Ltd, Rayonpuram

SHRI P. S. HARI HARAKRI-

SHNAN ( *Alternate* )

SHRI K. L. SAHGAL

Indian Paper Makers' Association, Calcutta

SHRI K. L. SAHNI

Salt Commissioner, Government of India, Jaipur

DR A. K. SEN

Ministry of Defence ( DGI )

SHRI J. P. AGARWAL ( *Alternate* )

( Continued on page 2 )

© Copyright 1978

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* ( XIV of 1957 ) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

( Continued from page 1 )

<i>Members</i>	<i>Representing</i>
DR K. SESHADRI	Central Salt & Marine Chemicals Research Institute ( CSIR ), Bhavnagar
DR D. R. BAXI ( Alternate )	
SHRI K. SETHI	Indian Soap & Toiletries Makers' Association, Bombay
SHRI R. S. VAIDYANATHAN ( Alternate )	
SHRI S. SUBBIAH	Directorate General of Supplies & Disposals, New Delhi
SHRI N. G. S. IYER ( Alternate )	
SHRI B. R. WALAVALKAR	Saurashtra Chemicals, Porbandar
SHRI L. K. MALAVIYA ( Alternate )	
DR G. M. SAXENA, Director ( Chem )	Director General, ISI ( <i>Ex-officio Member</i> )

*Secretaries*  
SHRI P. S. ARORA  
Deputy Director ( Chem ), ISI  
SHRI BHUPINDER SINGH  
Assistant Director ( Chem ), ISI

**Panel for Salt and Marine Products, CDC 25 : P3**

<i>Convener</i>	
SHRI N. B. PATEL	Tata Chemicals Ltd, Mithapur
<i>Members</i>	
SHRI R. M. SHAH ( Alternate to Shri N. B. Patel )	
SHRI V. ARUN KUMAR	The Indian Salt Manufacturers' Association, Bombay
SHRI G. P. THACKER ( Alternate )	
SHRI P. N. DEVARAJAN	Shriram Vinyl & Chemical Industries, Kota
SHRI R. K. NARULA ( Alternate )	
DR M. J. MEHTA	Central Salt & Marine Chemicals Research Institute ( CSIR ), Bhavnagar
DR J. R. SANGHARI ( Alternate )	
SHRI S. M. MEHTA	The Atul Products Ltd, Atul
SHRI M. V. DESAI ( Alternate )	
SHRI K. L. SAHNI	Salt Commissioner, Government of India, Jaipur
SHRI B. N. LAHIRI ( Alternate )	
SHRI T. P. VENKATARAMAN	Standard Alkali Chemicals Division, Bombay
SHRI B. R. WALAVALKAR	Saurashtra Chemicals, Porbandar
SHRI L. K. MALAVIYA ( Alternate )	

*Indian Standard*  
**SPECIFICATION FOR**  
**SALT FOR HIDE CURING ( WET-SALTING )**  
*( Second Revision )*

**0. F O R E W O R D**

**0.1** This Indian Standard ( Second Revision ) was adopted by the Indian Standards Institution on 7 June 1978, after the draft finalized by the Alkalis and Chlorine Sectional Committee had been approved by the Chemical Division Council.

**0.2** This standard for hide curing salt was first issued in 1954 and subsequently revised in 1964. The standard was revised upgrading the requirement for sodium chloride content and deleting the requirement for sodium sulphate and nitrates. In the present revision additional requirements along with the methods of test for iron content, and matter soluble in water other than NaCl have been incorporated.

**0.3** The annual consumption of salt used for hide curing is estimated to be of the order of 62 000 tonnes. Curing of hides by the application of salt is carried out by two processes known in the trade as wet-salting and dry-salting, producing respectively wet-salted and dry-salted hides and skins. The main function of salt in curing hides is dehydration. The fibres of hides and skins, being dry, resist bacterial action for a much longer period than wet-salted stock. For dry-salting, the practice in the country is to use the naturally occurring *khari* salt but the Central Leather Research Institute has developed prepared compositions for this purpose. For wet-salting, ordinary common salt as such is widely used but this standard is intended to guide the curer in using the salt of the right quality and composition. For dry-salting of hides and skins, a separate standard is being formulated.

**0.4** This standard has clauses **2.3** and **3.1** which provide for agreement between the purchaser and the supplier.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

\*Rules for rounding off numerical values ( revised ).

## 1. SCOPE

**1.1** This standard prescribes the requirements and the methods of sampling and test for salt for hide curing ( wet-salting ).

## 2. REQUIREMENTS

**2.1 Description** — The material shall be a crystalline solid, white or pale pink or light grey in colour, free from visible contamination with clay, grit and other extraneous adulterants and impurities.

**2.2 Particle Size** — The salt for hide curing shall completely pass through 3.35 mm IS Sieve and 25 to 50 percent by mass of the material shall pass through 2.0 mm IS Sieve.

**2.3 Moisture Content** — Unless otherwise agreed to between the purchaser and the supplier, the moisture content of the material shall not be more than 6.0 percent by mass, when tested in accordance with the method prescribed in A-2 of IS : 253-1970\*.

**2.4 Preservatives** — Salt for hide curing shall contain any one of the three preservatives specified below in a quantity not less than 0.5 percent by mass of the material when tested in accordance with the method prescribed in Appendix A:

- a) Sodium pentachlorophenate,
- b) Sodium orthophenylphenate, and
- c) Zinc chloride.

**2.5 Denaturant** — Salt for hide curing shall contain not less than 0.2 percent by mass of kerosine oil, when tested in accordance with the method prescribed in Appendix B.

**2.6** The material shall also comply with the requirements given in Table 1 when tested in accordance with the methods prescribed in col 4 and 5 of the table.

## 3. PACKING AND MARKING

**3.1 Packing** — The material shall be supplied in bulk or in packages as agreed to between the purchaser and the supplier.

---

\*Specification for edible common salt ( *second revision* ).



**TABLE 1 REQUIREMENTS FOR SALT FOR HIDE CURING  
( WET-SALTING )**

( Clause 2.6 )

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO CL No. IN	
			Appendix C	IS : 253- 1970*
(1)	(2)	(3)	(4)	(5)
i)	Matter insoluble in water, percent by mass, <i>Max</i>	1.0	—	A-3
ii)	Sodium chloride ( as NaCl ), percent by mass, <i>Min</i>	97.0	—	A-4
iii)	Matter soluble in water other than NaCl, percent by mass, <i>Max</i>	2.0	—	A-6
iv)	Alkalinity ( as $\text{Na}_2\text{CO}_3$ ), percent by mass, <i>Max</i>	0.5	—	A-9
v)	Soluble iron compounds ( as Fe ), parts per mill- ion, <i>Max</i>	100	C-2	—

\*Specification for edible common salt ( *second revision* ).

## 3.2 Marking

**3.2.1** The packages shall be securely closed and marked with the following information:

- Name and mass of the material;
- Name of the manufacturer and recognized trade-mark, if any;
- Batch number; and
- Date of packing.

**3.2.2** The packages of salt for hide curing shall also be marked with the words ' POISONOUS, HANDLE WITH CARE '.

**3.2.3** The packages shall be labelled as shown in Fig. 5 of IS : 1260 ( Part I )-1973\*.

\*Pictorial marking for handling and labelling of goods: Part I Dangerous goods ( *first revision* ).

**3.2.4** The packages may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## **4. SAMPLING**

**4.1** Representative samples of the material shall be drawn and their criteria for conformity shall be determined in accordance with the methods prescribed in Appendix D.

# **A P P E N D I X   A**

( *Clause 2.4* )

## **DETERMINATION OF PRESERVATIVES**

### **A-1. SODIUM PENTACHLOROPHENATE**

**A-1.0 General** — For determination of sodium pentachlorophenate, the photo-electric absorptiometric method shall be used as referee method, and the colorimetric method shall be used as a routine method.

#### **A-1.1 Photo-Electric Absorptiometric Method**

##### **A-1.1.1 Apparatus**

**A-1.1.1.1 Photoelectric absorptiometer** — any suitable type of instrument may be used, following the manufacturer's instructions.

##### **A-1.1.2 Reagents**

**A-1.1.2.1 Standard sodium pentachlorophenate solution** — Dissolve 2.500 g of sodium pentachlorophenate in water containing about 10 ml of sodium hydroxide solution ( 10 percent ) and dilute to 1 litre. Dilute further 100 ml of this solution to 1 litre with water also containing about 10 ml of sodium hydroxide solution ( 10 percent ). One millilitre of the diluted solution contains 0.25 mg of sodium pentachlorophenate.

**A-1.1.2.2 Sulphuric acid** — 1 : 3 ( v/v ).

**A-1.1.2.3 Chloroform** — reagent grade.

**A-1.1.2.4 Copper sulphate-pyridine reagent** — Dissolve 6 g of reagent grade copper sulphate in 114 ml of water and add to the solution 80 g of pure pyridine.

### **A-1.1.3 Procedure**

#### **A-1.1.3.1 Preparation of calibration curve**

- a) Place measured volumes of standard sodium pentachlorophenate solution, for example, 8.0 ml, 12.0 ml, 16.0 ml, 20.0 ml, 24.0 ml, 28.0 ml and 32.0 ml corresponding to 2.0 mg, 3.0 mg, 4.0 mg, 5.0 mg, 6.0 mg, 7.0 mg and 8.0 mg respectively of sodium pentachlorophenate in separate 500-ml round bottom flasks. Fit the flasks for steam distillation with splash head, connecting through a water-cooled Liebig condenser with a drip end, to 500 ml separating funnels. Add 10 ml of sulphuric acid to the solution in each flask and dilute the contents to approximately 310 ml. Add a few boiling chips, boil the mixture and collect 250 ml of distillate in each separating funnel.
- b) Extract each distillate 3 times with 15 ml of chloroform, the first portion of which is also used to wash down any traces of pentachlorophenol from the condenser into the separating funnel. Combine together the chloroform extracts for each separating funnel in separate 250 ml separating funnels and add to each funnel 20 ml of water, followed by 2 ml of copper sulphate-pyridine reagent. Shake the mixture continuously for five minutes and allow the two layers to separate. Run off each coloured chloroform layer through a separate chloroform-moistened 7-cm filter paper in a small funnel into separate 50-ml graduated flasks. Wash the filter paper with chloroform and make up the solution in each flask to the mark with chloroform.
- c) Measure the intensity of the colour using the photoelectric absorptiometer, a 4-cm cell, heat-absorbing glass filter H 503 in conjunction with spectrum violet gelatine filter No. 601, and chloroform as the blank solution. Prepare a calibration curve relating colour intensity against the quantity of sodium pentachlorophenate.

**A-1.1.3.2** Dissolve about 1 g of the material, accurately weighed, in 10 ml of water and treat as described in **A-1.1.3.1**. Read the quantity of sodium pentachlorophenate from the calibration curve.

#### A-1.1.4 Calculation

$$\begin{array}{l} \text{Sodium pentachlorophenate,} \\ \text{percent by mass} \end{array} = \frac{M_1}{10 M_2}$$

where

$M_1$  = mass in mg of sodium pentachlorophenate as read from the calibration curve, and

$M_2$  = mass in g of the material taken for the test.

### A-1.2 Colorimetric Method

#### A-1.2.1 Apparatus

**A-1.2.1.1** *Nessler cylinders* — 50 ml capacity.

**A-1.2.2** *Reagents* — same as under **A-1.1.2**.

#### A-1.2.3 Procedure

**A-1.2.3.1** Treat a series of standard pentachlorophenate solutions as prescribed in **A-1.1.3.1(a)** and **A-1.1.3.1(b)** except that the final coloured chloroform solution shall be collected in a series of Nessler cylinders instead of graduated flasks. These solutions remain stable for two or three days but it is recommended that for comparison, the standards should be prepared on the same day.

**A-1.2.3.2** Dissolve about 1 g of the material, accurately weighed, in 10 ml of water and treat as in **A-1.2.3.1**. Match the colour against the series of standards prepared as **A-1.2.3.1**.

#### A-1.2.4 Calculation

$$\begin{array}{l} \text{Sodium pentachlorophenate,} \\ \text{percent by mass} \end{array} = \frac{M_1}{10 M_2}$$

where

$M_1$  = mass in mg of sodium pentachlorophenate present in the matching Nessler cylinder, and

$M_2$  = mass in g of the material taken for the test.

## A-2. SODIUM ORTHOPHENYLPHENATE

**A-2.0 General** — For determination of sodium orthophenylphenate, the spectrophotometric method prescribed in **A-2.1** shall be the referee method and the colorimetric method prescribed in **A-2.2** shall be the alternate method.

## A-2.1 Spectrophotometric Method

### A-2.1.1 Apparatus

**A-2.1.1.1 Spectrophotometer** — any suitable type of instrument may be used following the manufacturer's instructions.

### A-2.1.2 Reagents

**A-2.1.2.1 Sodium hydroxide — sodium sulphate solution** — prepared by dissolving 30 g of sodium hydroxide and 150 g of sodium sulphate decahydrate in 1 litre of water.

**A-2.1.2.2 Standard sodium orthophenylphenate solution** — Dissolve 0.500 g of sodium orthophenylphenate in a 1-litre volumetric flask containing a mixture of 900 ml of water and 50 ml of sodium hydroxide—sodium sulphate solution. Dilute the contents to the mark and mix the contents well. Transfer 100 ml of the solution into another 1-litre volumetric flask, add about 45 ml of sodium hydroxide—sodium sulphate solution and dilute with water to the mark. One millilitre of the diluted solution contains 0.05 mg of sodium orthophenylphenate.

**A-2.1.2.3 Gum acacia solution** — 1 percent.

**A-2.1.2.4 Sodium acetate ( trihydrate ) solution** — 50 percent.

**A-2.1.2.5 *p*-Nitroaniline diazonium salt solution** — 0.5 percent solution, freshly prepared.

NOTE — This salt is available commercially under the name Brentamine Fast Red GG Salt ( Colour Index No, 37035 of the Society of Dyers and Colourists, UK, Second edition. 1956 ).

**A-2.1.2.6 Sodium carbonate solution** — 20 percent.

### A-2.1.3 Procedure

**A-2.1.3.1 Preparation of calibration curve** — Place measured volumes of standard sodium orthophenylphenate solution, for example, 0.0 ml, 0.5 ml, 1.0 ml, 1.5 ml, 2.0 ml, 2.5 ml, 3.0 ml, 3.5 ml and 4.0 ml in separate test-tubes and add water to each to make the total volume 10.0 ml. To each tube add 1 ml of gum acacia solution, 1 ml of sodium acetate solution, and 1 ml of *p*-nitroaniline diazonium salt solution; after one minute add 2 ml of sodium carbonate solution. Shake the contents of each tube and measure the intensity of colour in each tube using a 1-cm cell at a wavelength of 494 nm. Prepare a calibration curve relating colour intensity against the quantity of sodium orthophenylphenate.

**A-2.1.3.2** Dissolve 1.000 g of the material in a 100 ml measuring flask in a mixture of 90 ml of water and 5 ml of sodium hydroxide—sodium sulphate solution. Make up the volume with water. Pipette out 3 ml of the solution into a test-tube and add 7 ml of water. Proceed as prescribed in **A-2.1.3.1** and read the quantity of sodium orthophenylphenate from the calibration curve.

#### A-2.1.4 Calculation

$$\text{Sodium orthophenylphenate, percent by mass} = \frac{10 M}{3}$$

where

$M$  = mass in mg of sodium orthophenylphenate as read from the calibration curve.

### A-2.2 Colorimetric Method

#### A-2.2.1 Apparatus

**A-2.2.1.1** *Nessler cylinders* — 25 ml capacity.

**A-2.2.2** *Reagents* — same as under **A-2.1.2**.

#### A-2.2.3 Procedure

**A-2.2.3.1** Treat a series of standard orthophenylphenate solutions as prescribed in **A-2.1.3.1** except that the final coloured solutions shall be quantitatively transferred to a series of Nessler cylinders.

**A-2.2.3.2** Dissolve 1.000 g of the material as in **A-2.1.3.2** in a 100-ml measuring flask. Pipette out 3 ml of the solution into a Nessler cylinder and proceed as in **A-2.2.3.1**. Match the colour developed against the series of standards prepared in **A-2.2.3.1**.

#### A-2.2.4 Calculation

$$\text{Sodium orthophenylphenate, percent by mass} = \frac{10 M}{3}$$

where

$M$  = mass in mg of sodium orthophenylphenate present in the matching Nessler cylinder.

### A-3. ZINC CHLORIDE

#### A-3.1 Reagents

**A-3.1.1** *Standard Zinc Solution* — Dissolve 0.1 g of chemically pure zinc in 10 ml of concentrated hydrochloric acid. Neutralize the solution with ammonium hydroxide and dilute to 1 000 ml in a volumetric flask. One millilitre of the solution contains 0.1 mg of zinc ( as Zn ).

**A-3.1.2** *Dilute Sulphuric Acid* — 1.2 (  $v/v$  ).

**A-3.1.3 Ammonium Chloride**

**A-3.1.4 Diphenylamine Indicator Solution** — Dissolve 1 g of diphenylamine in 100 ml of concentrated sulphuric acid.

**A-3.1.5 Standard Potassium Ferrocyanide Solution** — Dissolve 7 g of potassium ferrocyanide [ $K_4Fe(CN)_6 \cdot 3H_2O$ ] and 0.1 g of potassium ferricyanide in water and make the solution up to 1 000 ml. Standardize the solution against standard zinc solution by the procedure given in **A-3.2** and determine the amount of zinc equivalent to 1 ml of standard potassium ferrocyanide solution.

**A-3.2 Procedure** — Dissolve 50 g of the material, weighed to an accuracy of 0.1 g, in a 500 ml volumetric flask. Dilute the contents of the flask to the mark. Transfer 100 ml of the solution to a conical flask, add 15 ml of dilute sulphuric acid, 10 g of ammonium chloride and 2 drops of diphenylamine indicator solution. Heat the contents of the flask to about 60°C and titrate with standard potassium ferrocyanide solution until the blue colour changes to a yellowish green ( *see Note* ).

**NOTE** — At the beginning of the titration, the liquid appears blue and becomes increasingly dark, until at about 0.5 ml before the true end point is reached, the solution changes suddenly to yellowish green; but on standing for a few seconds the colour changes back to blue. The titration is continued drop by drop until the colour changes to a yellowish green which remains for 20 seconds.

**A-3.3 Calculation**

$$\text{Zinc ( as } ZnCl_2 \text{ ), percent by mass} = \frac{1.043 AV}{M}$$

where

$A$  = mass in mg of zinc equivalent to 1 ml of standard potassium ferrocyanide solution,

$V$  = volume in ml of standard potassium ferrocyanide solution used in the titration, and

$M$  = mass in g of the material taken for the test.

**APPENDIX B**

( *Clause 2.5* )

**DETERMINATION OF KEROSENE OIL****B-1. REAGENTS**

**B-1.1 Ether** — *see* IS : 336 1973\*.

\*Specification for ether ( *second revision* ).

**B-2. PROCEDURE**

**B-2.1** Weigh accurately about 10 g of the material and place it in a Soxhlet extraction apparatus preferably having ground-glass joints. Add 200 ml of ether and carry out the extraction for 6 hours. Regulate the heating during this period so that siphoning takes place every 4 to 5 minutes. After cooling to room temperature, distil the ether extract to remove about 120 ml of ether. Transfer the remaining contents to a previously dried and weighed evaporating dish of about 75 mm diameter. Place the dish on a water-bath and remove almost the whole of the ether. Then place the dish in a well-ventilated oven at  $50 \pm 2^\circ\text{C}$  for one hour. Cool in a desiccator and weigh.

**B-3. CALCULATION**

$$\text{Kerosine oil, percent by mass} = 100 \frac{M_1}{M_2}$$

where

$M_1$  = mass in g of the residue, and

$M_2$  = mass in g of the material taken for the test.

**A P P E N D I X C**

( Table 1 )

**ANALYSIS OF SALT FOR HIDE CURING ( WET-SALTING )****C-1. QUALITY OF REAGENTS**

**C-1.1** Unless specified otherwise, pure chemicals and distilled water ( see IS : 1070-1977\* ) shall be used in tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis.

**C-2. TEST FOR SOLUBLE IRON COMPOUNDS****C-2.1 Apparatus**

**C-2.1.1** *Nessler Cylinders* — 50 ml capacity.

**C-2.2 Reagents**

**C-2.2.1** *Concentrated Nitric Acid* — see IS : 264-1976†.

\*Specification for water for general laboratory use ( second revision ).

†Specification for nitric acid ( second revision ).



**C-2.2.2 Ammonium Persulphate** — solid.

**C-2.2.3 Butanolic Potassium Thiocyanate** — Dissolve 10 g of potassium thiocyanate in 10 ml of water. Add sufficient *n*-butanol to make up to 100 ml and shake vigorously until the solution is clear.

**C-2.2.4 Dilute Sulphuric Acid** — approximately 10 percent ( *v/v* ).

**C-2.2.5 Standard Iron Solution** — Weigh 0.702 g of ferrous ammonium sulphate [  $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$  ] and dissolve in 10 ml of dilute sulphuric acid. Dilute with water to make up the volume to 1 000 ml. Pipette out 10 ml of this solution, again dilute with water to 100 ml. One millilitre of this solution is equivalent to 0.01 mg of iron ( as Fe ).

**C-2.3 Procedure** — Weigh accurately about 1 g of the sample, dissolve it in water and make up the volume to 100 ml. Pipette out exactly 10 ml of this solution into a beaker, and 1 ml of nitric acid and boil. Cool, transfer the solution to a Nessler cylinder and add 30 mg of ammonium persulphate and 15 ml of butanolic potassium thiocyanate solution. Shake vigorously for 30 seconds and allow the layers to separate. Carry out a control test in the other Nessler cylinder, adding slowly from a burette a quantity of the standard iron solution in place of the material and the same quantities of other reagents in the same total volume of the reaction mixture until the colours of butanol layer in the two cylinders are exactly matched.

#### C-2.4 Calculation

$$\text{Iron ( as Fe ), percent by mass} = \frac{0.01 V}{M}$$

where

*V* = volume in ml of standard iron solution required in the control test, and

*M* = mass in g of the material taken for the test.

## APPENDIX D

( Clause 4.1 )

### SAMPLING OF SALT FOR HIDE CURING ( WET-SALTING )

#### D-1. GENERAL REQUIREMENTS OF SAMPLING

**D-1.0** In drawing, storing, preparing and handling test samples, the following precautions shall be observed.

**D-1.1** Samples shall not be taken at a place exposed to weather.

**D-1.2** Precautions shall be taken to protect the samples, the sampling instrument and the containers for samples from adventitious contamination.

**D-1.3** To draw a representative sample, the contents of each container selected for sampling shall be mixed thoroughly by suitable means.

**D-1.4** The samples shall be placed in suitable, clean, dry and air-tight glass containers.

**D-1.5** Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling and year of manufacture.

## **D-2. SCALE OF SAMPLING**

**D-2.1 Lot** — All the packages in a single consignment of salt for hide-curing drawn from a single batch of manufacture shall constitute a lot. If the consignment is declared to consist of different batches, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

**D-2.1.1** The number of packages ( $n$ ) to be selected from the lot shall depend upon the size of the lot ( $N$ ) and shall be in accordance with Table 2.

---

**TABLE 2 NUMBER OF PACKAGES TO BE SELECTED FOR SAMPLING**

LOT SIZE	NO. OF PACKAGES TO BE SELECTED
$N$	$n$
(1)	(2)
Up to 50	3
51 „ 100	4
101 „ 150	5
151 „ 300	7
301 and above	10

---

**D-2.1.2** These packages shall be selected at random from the lot. In order to ensure the randomness of selection, random sampling procedures given in IS : 4905-1968\* may be followed.

**D-2.1.3** Samples shall be tested for each lot for ascertaining conformity of the material to the requirements of this specification.

---

\*Methods for random sampling.

### D-3. PREPARATION OF TEST SAMPLES

#### D-3.1 Packages

**D-3.1.1** From each of the packages selected according to **D-2.1.2** a portion of material about 750 g shall be drawn with the help of a suitable sampling instrument.

**D-3.1.2** Out of these portions, equal quantities of the material shall be taken and mixed thoroughly to form a composite sample of about 2 kg. The composite sample shall be divided into three equal parts, one for the purchaser, one for the supplier and third to be used as a referee sample.

**D-3.1.3** The remaining portion of the material from each container shall be divided into three equal parts, each forming an individual sample. One set of individual samples representing  $n$  containers sampled shall be marked for the purchaser, another for the supplier and the third to be used as a referee sample.

**D-3.2** All the individual samples and the composite sample shall be transferred to separate sample containers. All the containers shall be sealed and labelled with full identification particulars.

**D-3.3** The referee test samples consisting of a composite sample and a set of individual samples shall bear the seal of both the purchaser and the supplier. They shall be kept at a place agreed to between the purchaser and the supplier, to be used in case of dispute between the two.

#### D-4. NUMBER OF TESTS

**D-4.1** For moisture content, matter insoluble in water and sodium chloride, tests shall be performed on each of the individual samples.

**D-4.2** Tests for the determination of all other characteristics given in 2 shall be performed on the composite sample ( *see D-3.1.2* ).

#### D-5. CRITERIA FOR CONFORMITY

**D-5.1 For Individual Samples** — From the test results, the mean ( $\bar{X}$ ) and the range ( $R$ ) shall be computed for each of the characteristics tested on individual samples ( the range being defined as the difference between the maximum and minimum values of the test results ). The appropriate expression as shown in col 5 of Table 3 shall be calculated for these characteristics. If the values of the expressions satisfy the conditions as given in col 5 of Table 3, the lot shall be declared to have satisfied the requirements of these characteristics.

**TABLE 3 CRITERIA FOR CONFORMITY BASED ON  
INDIVIDUAL SAMPLES**

( Clause D-5.1 )

SL No.	CHARACTERISTIC	AVERAGE OF TEST RESULTS 1, 2, 3,	RANGE	CRITERION FOR CONFORMITY
(1)	(2)	(3)	(4)	(5)
i)	Moisture content	$\bar{X}_1$	$R_1$	( $\bar{X}_1 + 0.6 R_1$ ) shall be less than or equal to 6.0
ii)	Sodium chloride content	$\bar{X}_2$	$R_2$	( $\bar{X}_2 - 0.6 R_2$ ) shall be greater than or equal to 97.0
iii)	Matter insoluble in water	$\bar{X}_3$	$R_3$	( $\bar{X}_3 + 0.6 R_3$ ) shall be less than or equal to 1.0

**D-5.2 For Composite Sample** — The lot shall be considered to have passed in respect of the characteristics tested on the composite test sample if the test results satisfy the corresponding requirements given in 2.

**D-5.3** The lot shall be considered as conforming to the specification if it satisfies all the criteria given in **D-5.1** and **D-5.2**.

# INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

## Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

## Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

## Derived Units

QUANTITY	UNIT	SYMBOL	CONVERSION
Force	newton	N	1 N = 0.101 972 kgf
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Pressure, stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

## INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephone : 27 01 31 ( 20 lines )

Telegrams : Manaksanstha

Regional Offices :

Telephone

Western : Novelty Chambers, Grant Road

BOMBAY 400007

37 97 29

Eastern : 5 Chowringhee Approach

CALCUTTA 700072

23-08 02

Southern : C.I.T. Campus Adyar

MADRAS 600020

41 24 42

Branch Offices :

'Pushpak', Nurmohamed Shaikh Marg, Khanpur

AHMADABAD 380001

2 03 51

'F' Block, Unity Bldg, Narasimharaja Square

BANGALORE 560002

2 76 49

R-26, Guru Teg Bahadur Complex

BHOPAL 462003

6 27 16

Showhouse Bldg, Sachivalaya Marg

BHUBANESHWAR 751001

5 36 27

Ahimsa Bldg, SCO 82-83, Sector 17C

CHANDIGARH 160017

2 83 20

6-8-56/57 L. N. Gupta Marg

HYDERABAD 500001

22 10 83

D-277 Todermal Marg, Banipark

JAIPUR 302006

6 98 32

117/418 B Sarvodaya Nagar

KANPUR 208005

82 72

B.C.I. Bldg ( 3rd Floor ), Gandhi Maidan East

PATNA 800004

5 36 65

Hantex Bldg ( 2nd Floor ), Rly Station Road

TRIVANDRUM 695001

32 27

Printed at Filatograph, New Delhi, India